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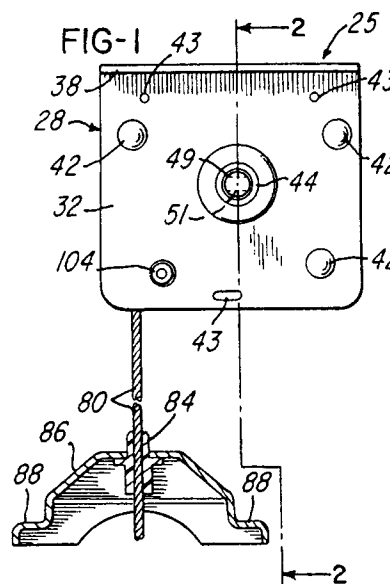
**EUROPEAN PATENT APPLICATION**(21) Application number: **91310317.2**(51) Int. Cl.<sup>5</sup>: **B62D 43/04, B66D 1/30,  
B66D 1/14, B66D 1/54**(22) Date of filing: **07.11.91**(30) Priority: **01.04.91 US 678605**(43) Date of publication of application:  
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**13.01.93 Bulletin 93/02**(71) Applicant: **DEUER MANUFACTURING INC.**  
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**BARON & WARREN, 18 South End,**  
**Kensington**  
**London W8 5BU(GB)**(54) **Compact tire lift unit.**

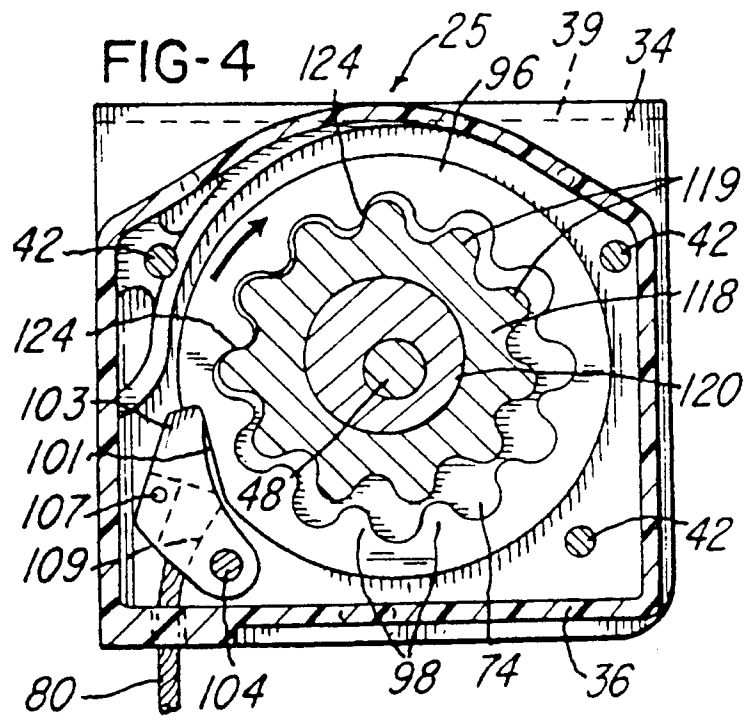
(57) The invention relates to a vehicle spare tire lift unit including a drive shaft (48) rotatably mounted in spaced walls (32, 34) of a housing. A spool (60) is rotatably mounted on the shaft (48) within the housing, and is coupled to the shaft via a reduction gear train and a torque-limiting clutch, so that multiple revolutions of the drive shaft are required to produce each revolution of the spool (60). A cable (80) for supporting a spare wheel and tire is anchored by its inner end in the base of a narrow annular track (76) in the spool (60). The track (76) has a width substantially the same as the diameter of the cable so that the cable wraps radially outwardly around itself in a spiral overlapping manner.

The spool comprises first and second plate members (62, 74) which define the narrow track (76) therebetween. The second plate member (74) is mounted on a hub (68) of the first plate member (62) and is fixed against rotation relative thereto.

The reduction gear includes a gear ring (96) having internal, i.e. inwardly directed gear teeth (98), formed integrally with the second plate member (74). Within the internally geared ring (96) is a gear (118) having external, i.e. outwardly directed gear teeth (119). The external gear (118) is formed integrally with a control plate (115) rotatably mounted on an eccentric or cam (120). The eccentric is rotatably

mounted on the drive shaft (48), and is rotatably driven by the drive shaft via the torque-limiting clutch (125). The external gear (118) orbits within the internally geared ring (96), but is prevented from rotating, upon rotation of the drive shaft and eccentric, to produce the reduced-ratio rotation of the ring (96), and therefore of the spool.







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## EUROPEAN SEARCH REPORT

Application Number

EP 91 31 0317

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	WO-A-9 015 773 (SPARTON) * page 13, line 6 - page 14, line 24; figure 1; page 17, line 21 - page 18, line 3; page 16, lines 1-9; page 10, line 13 - page 11, line 3 *	1-3,6	B 62 D 43/04 B 66 D 1/30 B 66 D 1/14 B 66 D 1/54
A,D	US-E- 33 303 (DENMAN et al.) * figures 3,11,12 *	1,3	
A	WO-A-8 908 602 (SPARTON) * abstract *	3	
A	US-A-4 535 973 (DORR et al.) * column 4, line 54 - column 5, line 2 * -----	6,7	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 62 D B 66 D
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 25-06-1992	Examiner BROYDE M P
<b>CATEGORY OF CITED DOCUMENTS</b> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document			



## CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.



## LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-3,6,7: Compact tire-lift unit having two plate members defining a track, an attachment cavity for a cable, and a notch cooperating with a pawl.
2. Claims 4,5: Compact tire-lift unit with a gear preventing back-up of drive means.
3. Claims 8,9: Compact tire-lift unit with anti theft one-way coupling.
4. Claim 10: Compact tire-lift unit with torque limiting clutch.

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,

namely claims: 1-3,6,7